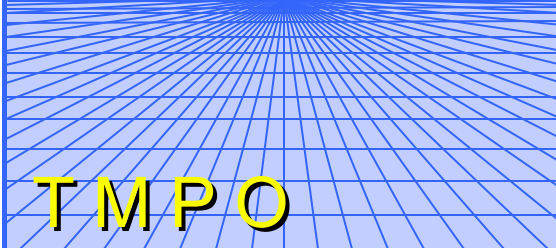


Terrain Modeling Project Office



Steve Wallach
(703) 275-8397, DSN 235-8397
wallachs@dma.gov



Modeling & Simulation Executive Agents (MSEA)

MSEAs for Environmental Representation for DoD Modeling and Simulation

TERRAIN

MajGen P. Nuber
DMA(D)

Mr Irv Buck
DMA(ATC)

Mr Steve Wallach
TMPO

Mr Steve Hall
TMPO

OCEANS

RADM P. Tobin, USN
CNO-N096

Dr Ed Whitman
CNO-N96T

Mr George Heburn
OEA for M&S

Mr George Heburn
OEA for M&S

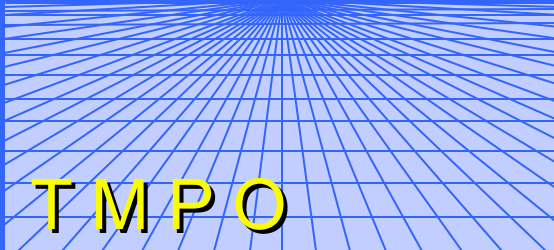
AEROSPACE

Brig Gen Lennon, USAF
AF/XOW

COL Joe Dushan, USAF
USAF/AWS

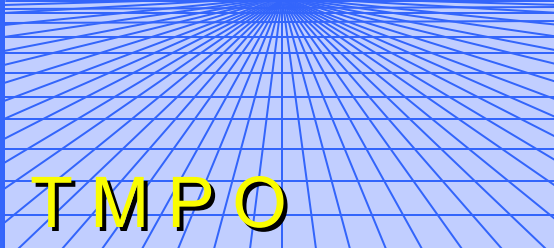
COL Frank Routhier, USAF
AFCCC

CDR Tim Cummings, USN
AS/NE EA for M&S



MSEA for Terrain

- DMA appointed by DDR&E and USD(A&T)
 - Senior DMA manager
 - Leads Terrain Modeling Project Office (TMPO)
- Represent DMA on all M&S terrain issues
- Serve as terrain advisor to DMSO
- Lead cooperative community effort
- Focus on specific needs
 - Refine the requirement
 - Actively support M&S system users and developers
 - Promote terrain data standards and data reuse
 - Coordinate R&D efforts to improve:
 - » Rapid terrain generation
 - » Dynamic effects



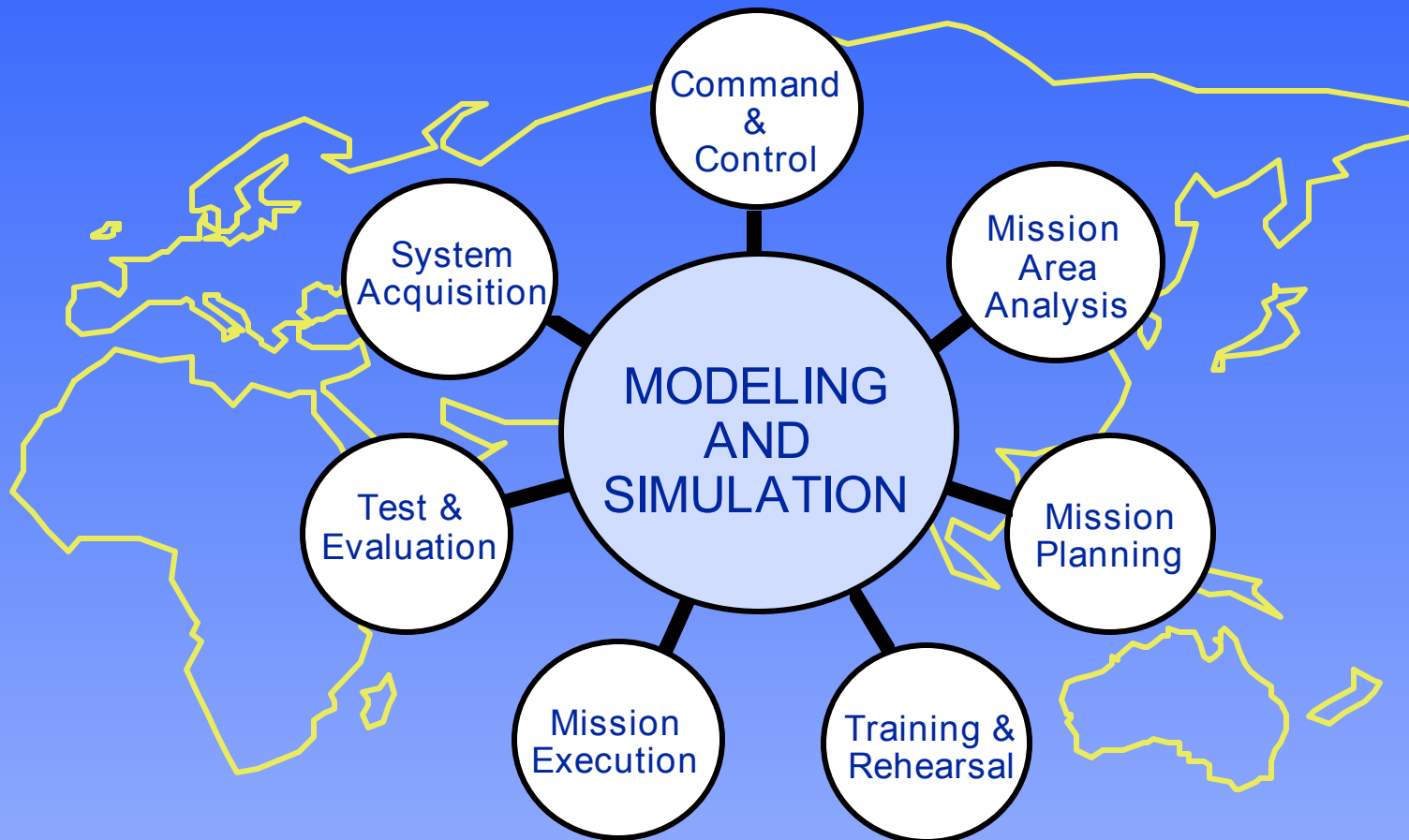
What is “Terrain”

Terrain: configuration, composition, and representation of the surface of the earth, including its relief, natural features, permanent manmade features, and related processes.

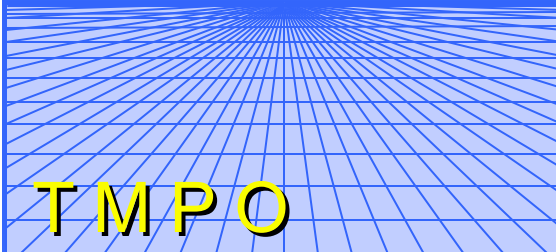
(The surface includes inland waters and extends to beyond the surf zone. The representation includes the mutual interaction of dynamic phenomena and the terrain. This representation does not include oceans, the atmosphere, or dynamic objects like people, weapons systems, or maneuvering icons)

TMPO

Vision



Common, interoperable, accurate representation of the earth's surface...leads to improved operational effectiveness



Team Effort for Terrain Support

DMA Director: MajGen Philip Nuber

Acquisition & Technology Directorate: Roberta Lenczowski

Customer Support Division: Irv Buck

TMPO:

- Chief - Steve Wallach
- Deputy Chief - Steve Hall
- S&T - Dr Bill Cornette
- DMAL DMSO - Bob Jacober
- Tech/Mgt Team
 - Jerry Lenczowski
 - Dr Young Suk Sull
 - Rich Stammier
 - LTC Bruce Donaldson
 - Terry Idol
 - Ernie Reith
 - Paul Salamonowicz

Terrain Team :

- Defense Modeling and Simulation Office
- Oceans and Aerospace EAs
- Joint & Service program offices and labs
- Advanced Research Projects Agency
- Service and Commands MC&G staffs
- DMA liaisons (Service and Command)
- M&S terrain team - DMA :
 - Air Force: Maj Diane Oswald
 - Army: LTC Joe Kotch
 - Marine Corps: Doug McCusker
 - Navy: Mary Clawson

... and the ENTIRE M&S Community

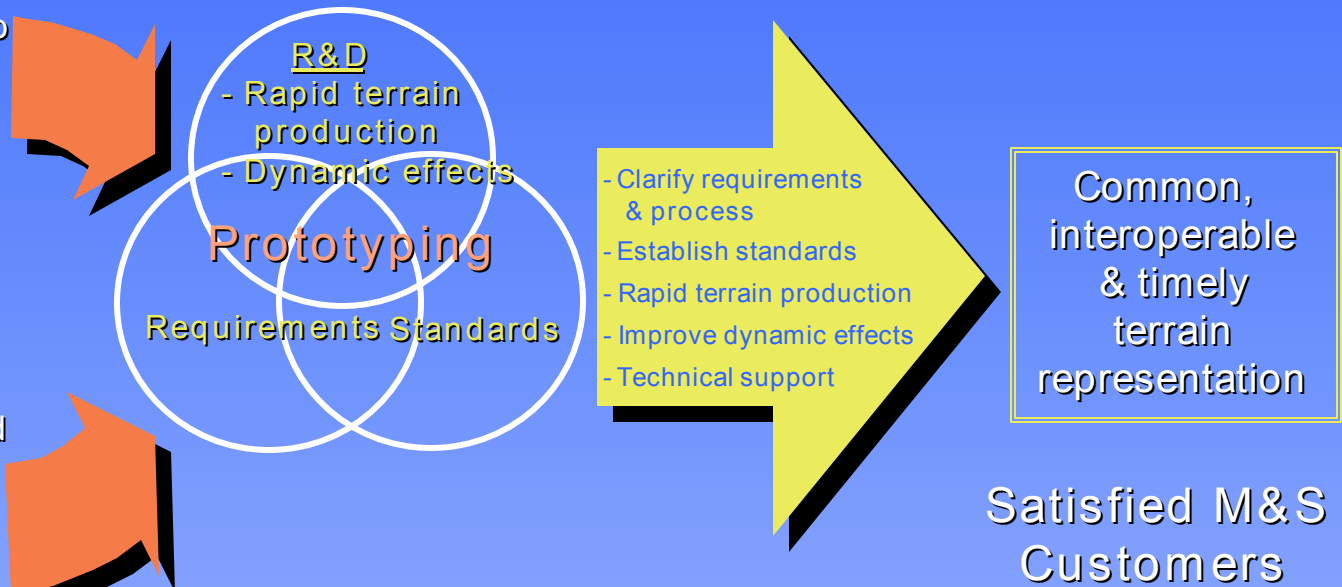
Shaping the Future

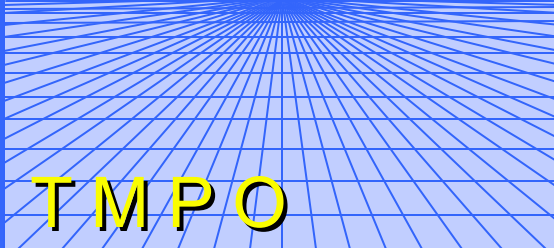
M&S Community Perspective

- Can't get data when I need it
- Terrain production takes too long, costs too much
- No M&S terrain standards
- Need scalable 3-D terrain
- Need better dynamic terrain
- Don't know what's going on across community

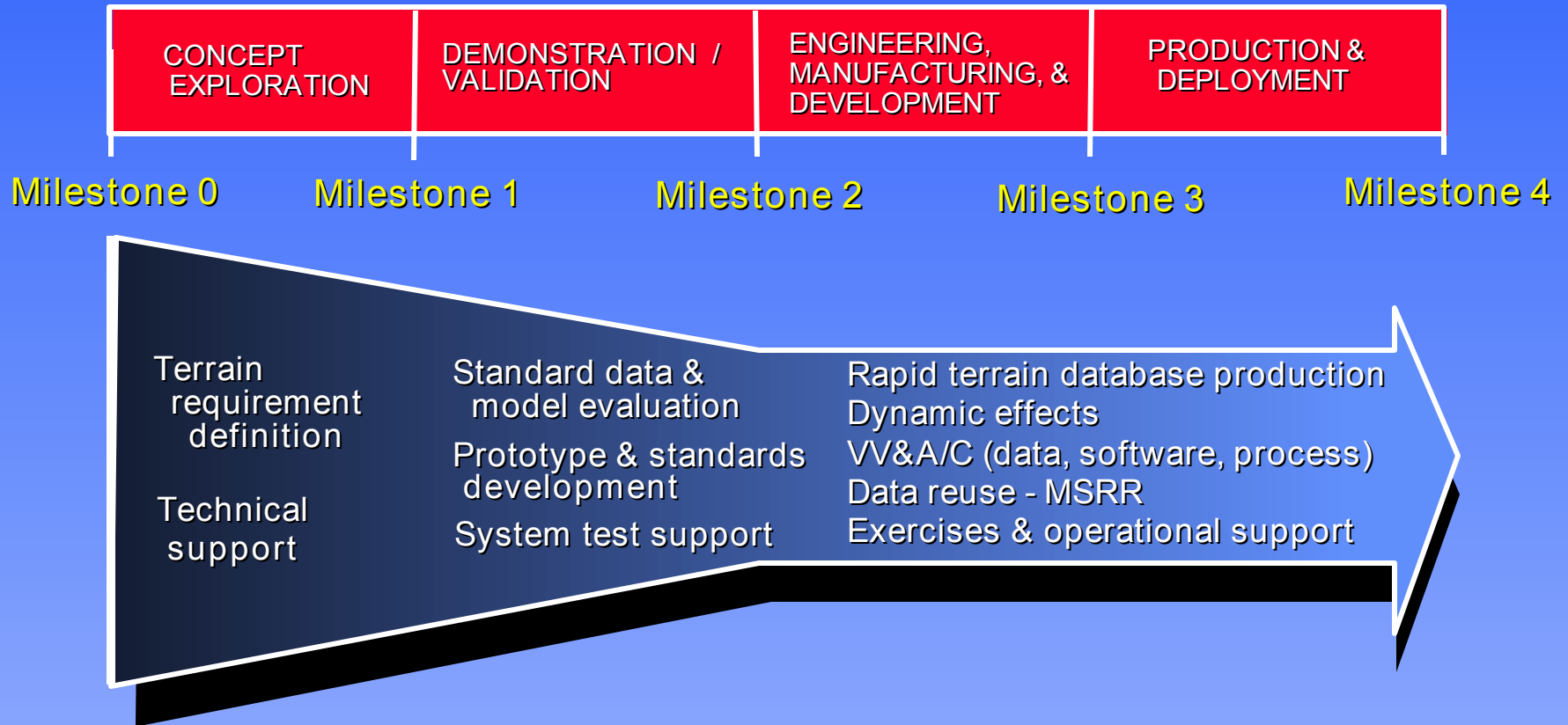
TMPO Perspective

- Requirements not submitted
- Terrain data is thrown away
 - Little data reuse
 - Dependent on contractor
- Redundant R&D
- Production systems not responsive to crises

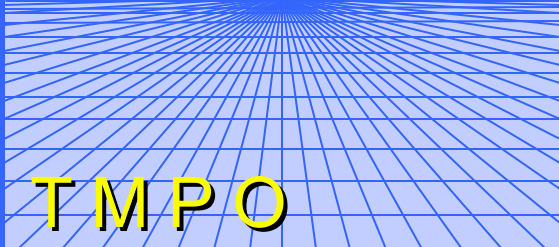




Aggressive Support to Developing Systems

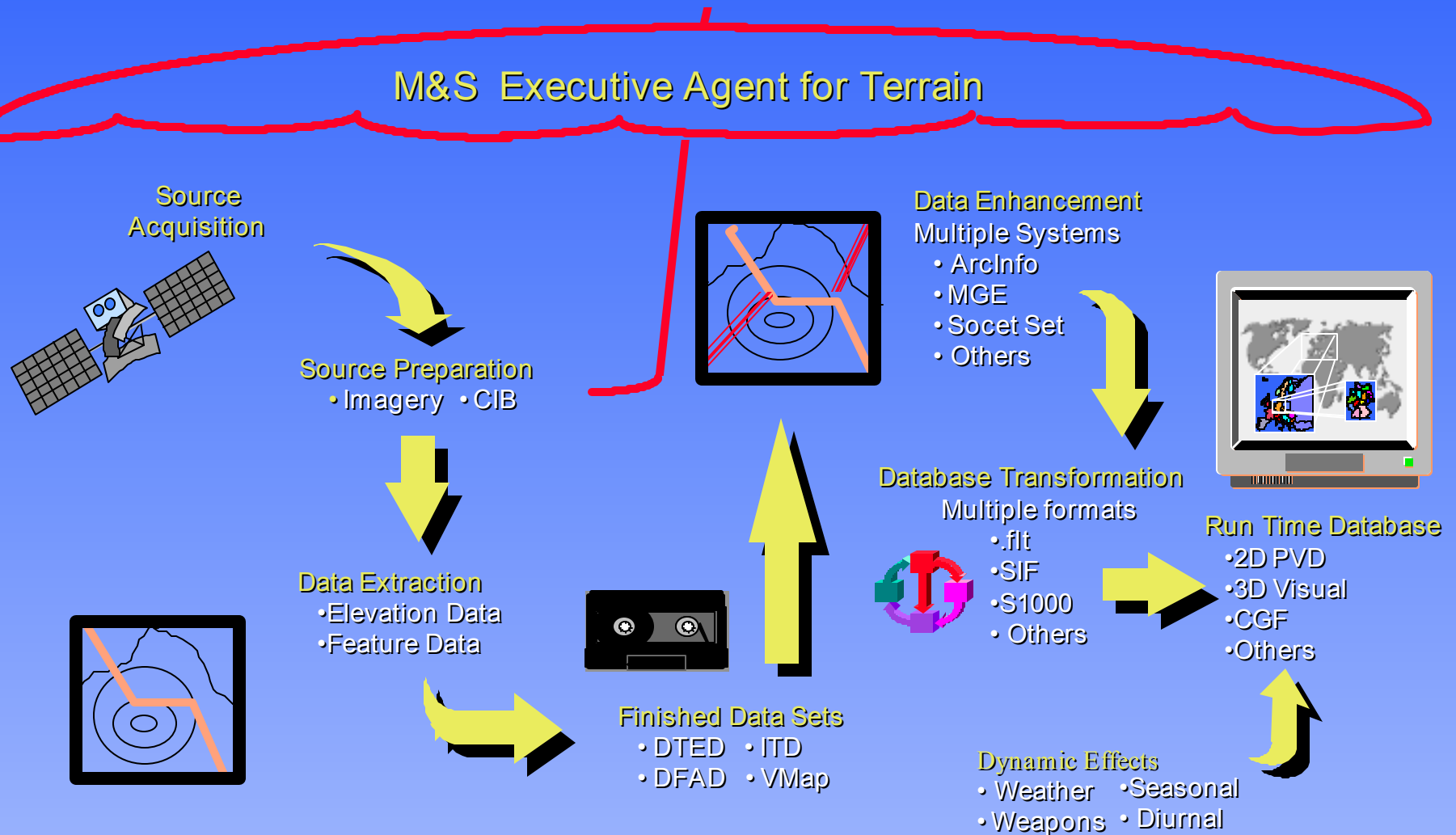


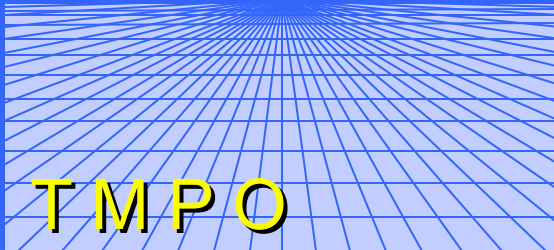
TMPO support ... from beginning to end



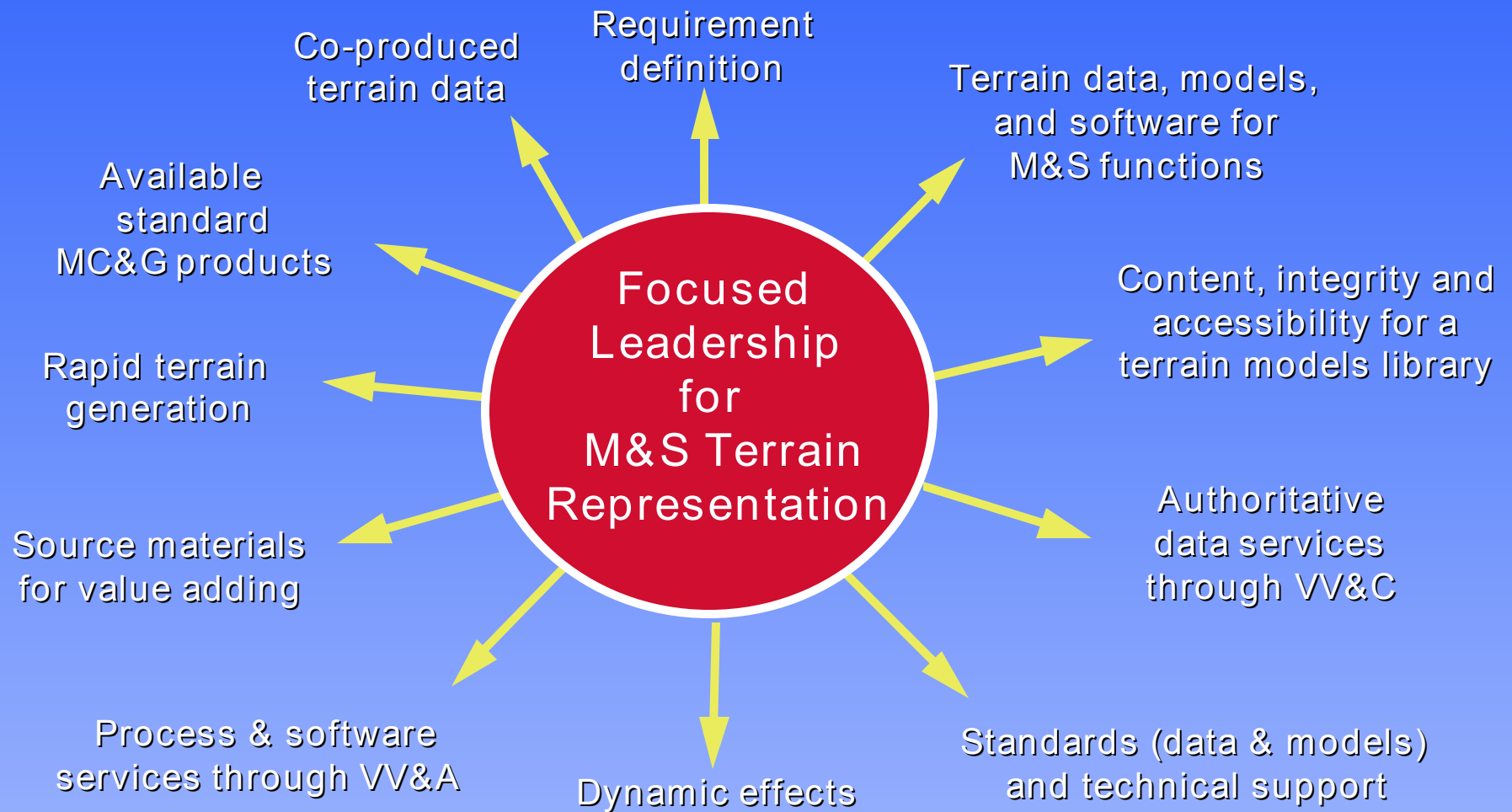
TMPO

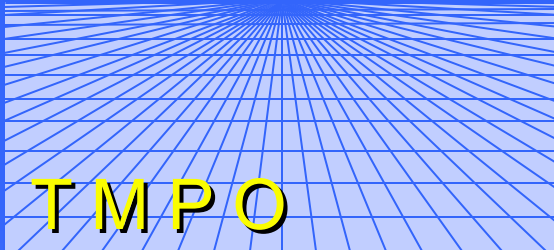
“End-to-End” Leadership





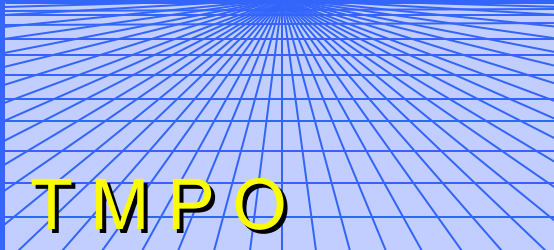
Reaching Out...





A Few Highlights...

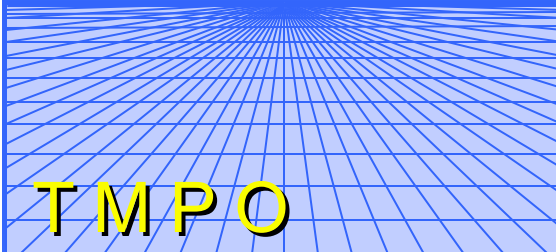
- Internet Connection
 - TMPO Home Page: <http://www.tmpo.dma.gov:8001/>
 - Requirements and systems database, terrain catalog (future)
 - Terrain Execution Plan, specifications, etc.
- Enhancement of Vector Product Format (VPF)
- Synthetic Environment Data Representation Interchange Specification (SEDRIS)
- Increased exercise support (STOW, Topo Force XXI, JWIDS)
- R&D for rapid terrain production
 - Advanced sensors
 - Automation
- R&D in dynamic terrain effects
- Prototyping
 - Europe
 - Littoral warfare test data
 - Fort Benning - McKenna MOBA/MOUT site and others



Summary

- “End-to-end” leadership for terrain activities
- Focused on system developers and operational users across the M&S community
 - Analysis, acquisition, training, and operations
- Executing a comprehensive execution plan that focuses terrain activities
- Actively evaluating and exploiting commercial capabilities
- Real benefits -- today

<http://www.tmpo.dma.gov:8001/>



The Program

REQTS, EXERCISE & TECH SUPPORT

- Community Tech Exchange & Support
- MOUT McKenna Data Sets Project
- Littoral Warfare Test Data Set
- Europe Test Data Set Scenario
- GGI&S Operational Assessment
- Battlefield Visualization ATD & ATCD
- Alternate Source Exploitation

STANDARDS AND INTERTOPERABILITY

- SEDRIS
- M&S Input to Standards
- Coordinate M&S-MC&G Stds Revisions
- VPF Enhancement Profile for M&S
- Data Validation Capability
- Resource Repository Virtual Data Base
- Intelligence Community Output Format
- VVA/VVC Candidates

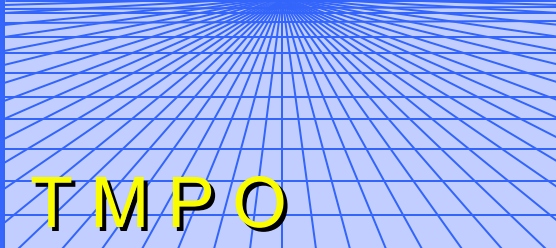
RESEARCH AND DEVELOPMENT

Rapid Terrain Generation

- Rapid Const Synth Env for ADS-CMU
- Rapid Extract DTED/Feature Data-GDE
- Radar DTED and Feature Extraction
- Terrain Elevation Extraction fm IFSAR
- Terrain Feature Generator
- Stand-Alone Data Extraction System
- Value-added Hi-Res Terrain Generation
- TTD VPF (MEDS)
- Laser Airbourne Bathymetry

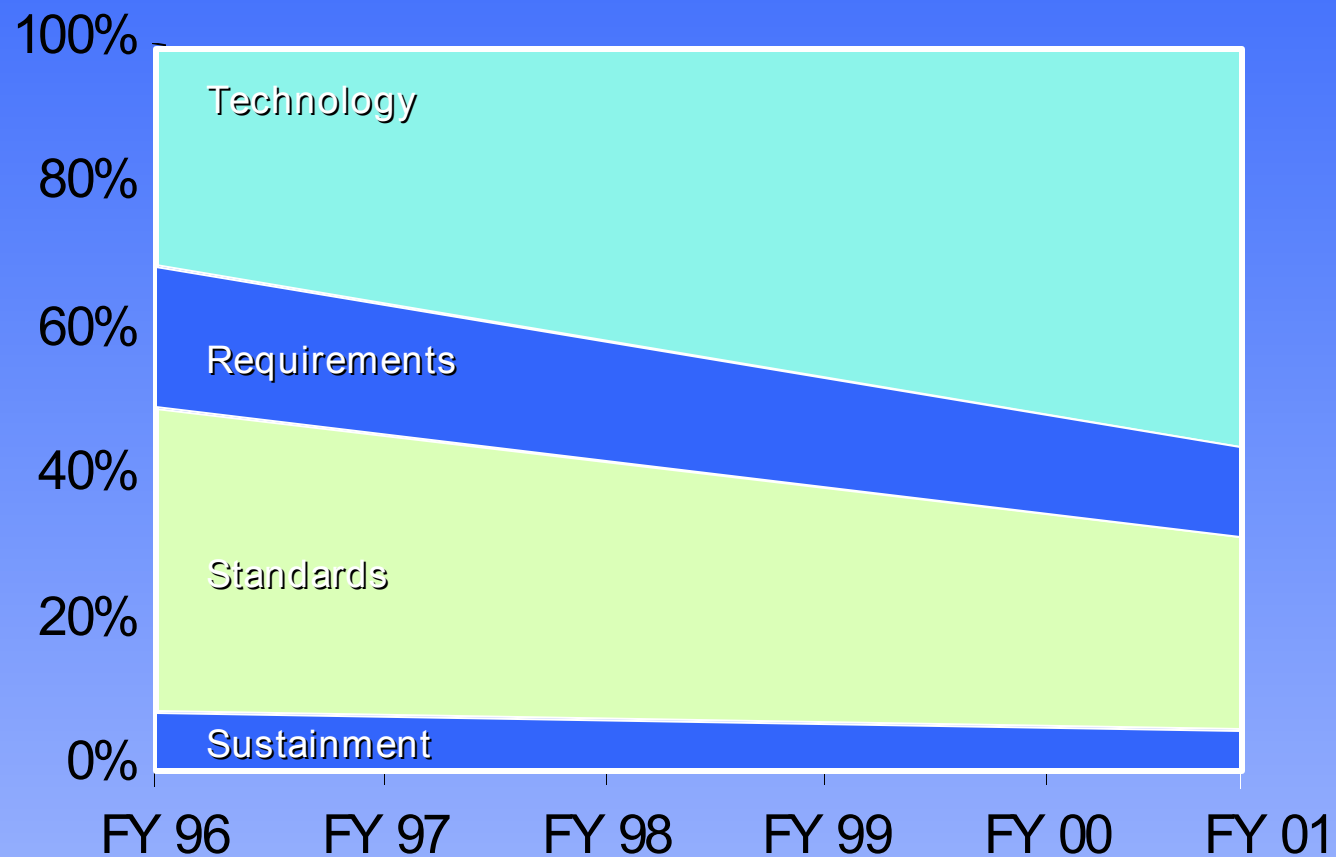
Dynamic Terrain

- Dynamic Terrain Objs in a Virtual World
- Dynamic Virtual Worlds
- Dynamic Terrain: A New Approach
- Integrated Computer Generated Forces Terrain Data Base Representation



Investment Strategy

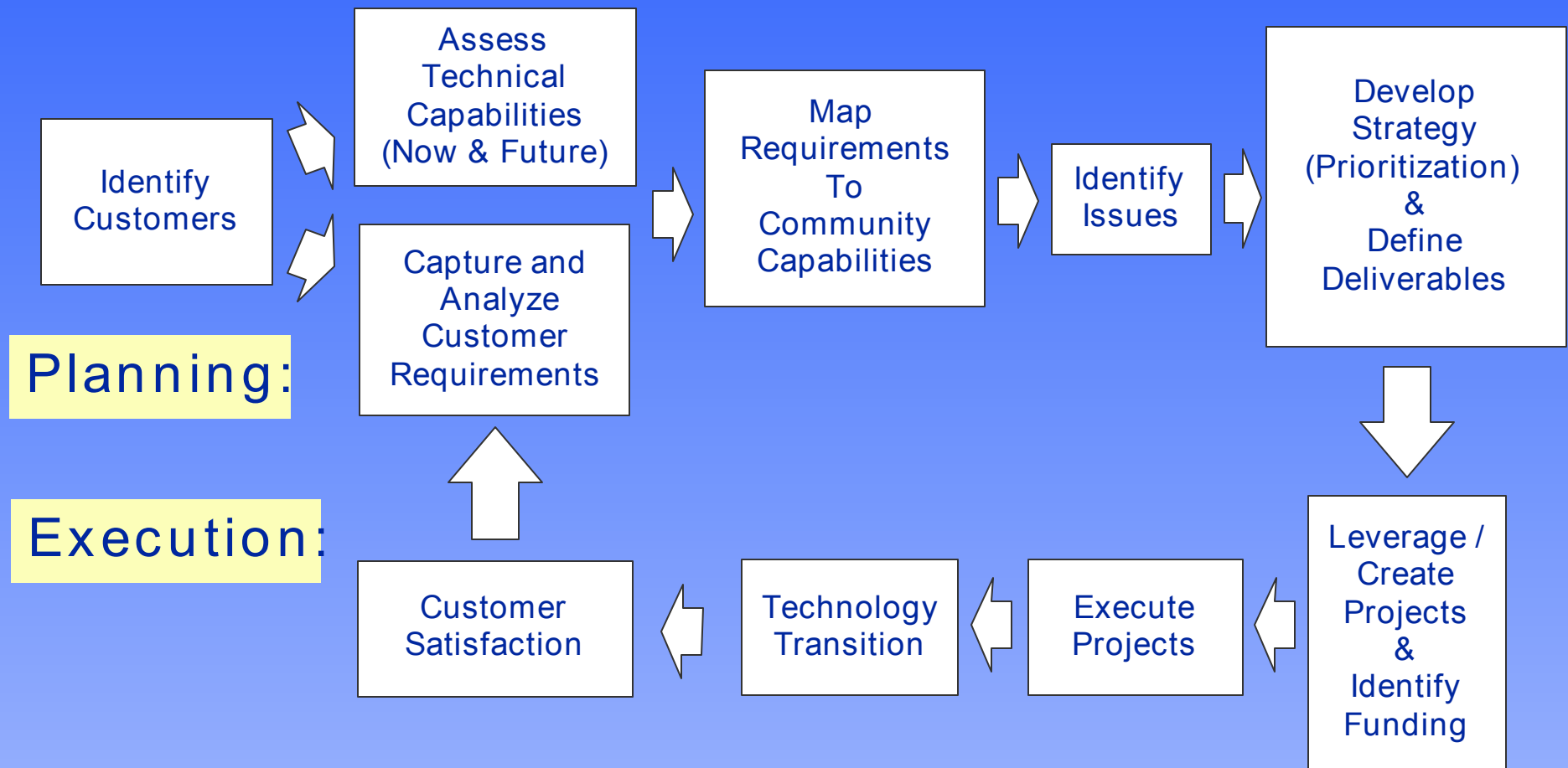
Notional Percent Effort in Each Program Area





TMPO

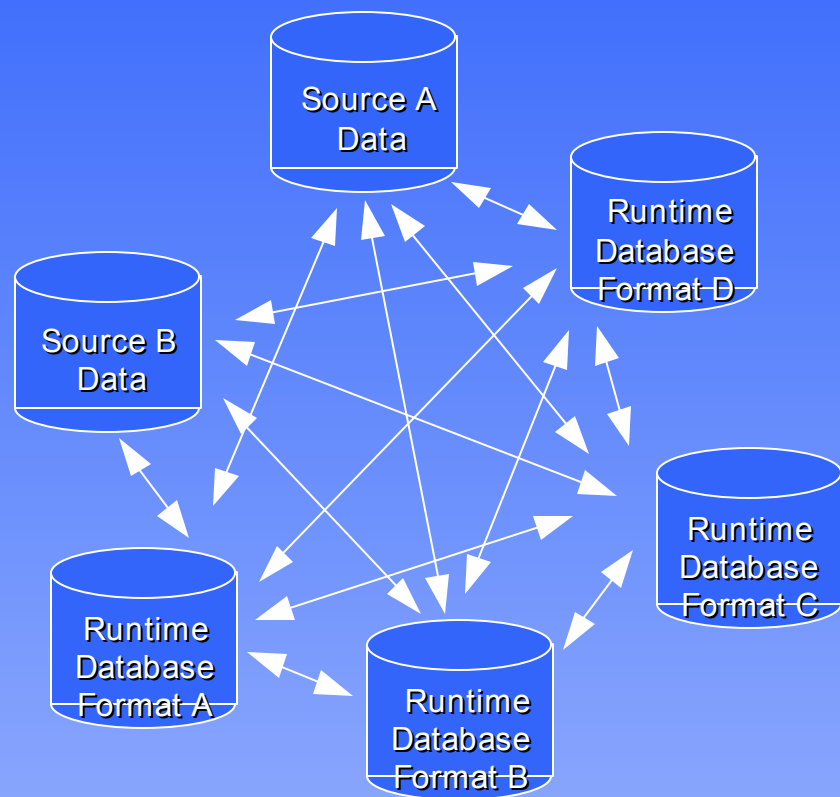
Business Model



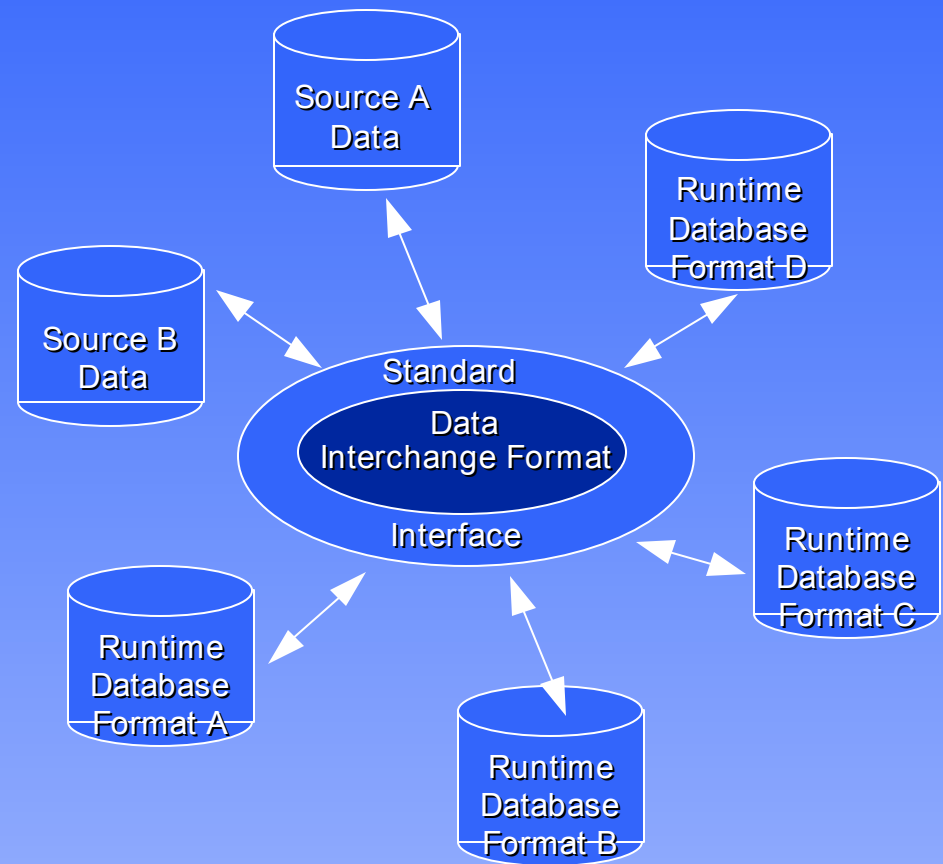


T M P O

Sharing M&S Databases



Today



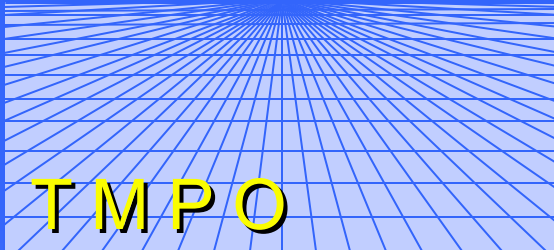
Future



TMPO

Tying the TEP to the MSMP

Objectives/Projects		Community Technical Exchange and Support	Europe Test Data Set	Littoral Test Data Set	MOUT McKenna Data Sets	Rapid Terrain Generation Exercises	Requirements & Req. Process Definition	Terrain Resource Repository	Coordinate MC&G/M&S Standards Revisions	Data Validation Capability	Intelligence Community Output Format	M&S Community Input to Standards	SEDRIS	VPF Enhancement Profile for M&S	Alternate Sensor Exploitation	Battlefield Visualization ATD/ACTD	Distributed Testbed	Dynamic Terrain: A New Approach	Dynamic Terrain Objects in a Virtual World	Dynamic Virtual Worlds	GGI&S Operational Assessment	Integrated CTDB in DIS	Laser Airborne Bathymetry System	Radar DTED and Feature Extraction	Rapid Construction Synthetic Envmnt - CMU	Rapid Extraction DTED/Feature Data - GDE	STand-Alone Data Extraction System Test	Terrain Elevation Extraction from IFSAR	Terrain Feature Generator	Tactical Terrain Data VPF (MEDS)	Value-added HI-Resolution Terrain Generation
	Sub Obj 2-1																														
Alternate/Commercial Source	2.b.(3)(a,c),(5)		--	--	--	--			--	--	--	--	--	--	--	--	--						--	--							
Automated Elevation Extraction	2.b.(3)(c)				--	--			--	--	--	--	--	--		--							--	--							
Automated Feature Extraction	2.b.(3)(c)				--	--			--	--	--	--	--	--									--	--							
Bridging MC&G & M&S	2.a.(1)	--	--	--	--	--	--							--		--	--	--	--	--	--				--	--	--			--	--
COTS Hardware/Software	2.b.(2)	--			--					--									--		--					--			--		
Data Reuse	(2), (4)-(6)																														
	(b-																														
Dynamic Effects	c),(7)(a,c)(8)	--						--	--	--	--	--	--	--							--									--	--
	2.b.(7)(a-c)			--						--				--		--		--	--	--		--									
Interoperability	2.b.(1)(b-d),		--			--	--		--	--	--	--	--	--		--															
	(2), (4), (6),	--	--	--	--	--	--	--	--	--	--	--	--	--		--			--		--								--	--	--
	(7)(a,c)(8)	--	--	--	--	--	--	--	--	--	--	--	--	--		--			--		--								--	--	--
Multi-res Data Integration	2.a.(1-2),								--	--	--	--	--	--		--					--	--									
	b.(1)(b),(3)	--		--	--	--	--	--		--	--	--	--	--		--						--	--								
Rapid Terrain Generation	2.b.(3)(b-e)				--	--	--	--	--	--	--	--	--	--		--	--				--	--									
Requirements Definition	2.a.(1),								--	--	--	--	--	--			--									--	--			--	--
	2.b.(3)(a)	--	--	--	--	--	--	--	--	--	--	--	--	--		--					--	--			--				--	--	--
Value Adding	2.b.(5), (8)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--													--	--
VV&A / VV&C	Sub Obj 5-1,2				--	--		--	--	--	--	--	--	--			--														



So, what have you done for me lately?

- TMPO staffed and fully involved with SEWG (Coordinate Conversion Posse, Surf Zone Posse, Glossary WG, EO/IR WG, hosted ISEWG, etc)
- Tri - EA Council Working Group established
- Home Page operational - over 12,300 hits since May 1995
- Requirements survey and database: on-line - initial report completed
- Customer list: on-line and growing
- MSRR/MEL development underway for terrain database access
- Europe Test data and systems fielded with technical support
- Fort Benning MOUT/MOBA data nearing completion
- Littoral Warfare Data prototype in-work
- Leading SEDRIS development and BAA evaluation team member
- VV&A of TAMPs
- Distributed Test Bed CONOPS completed
- Shuttle IFSAR DTED project underway (near-global DTED 2)
- Ongoing R&D in rapid terrain generation
 - Commercial source/sensor and “end-to-end” production evaluation
 - Automated terrain (elevation & feature) extraction
- Improvements demonstrated in rapid terrain generation exercises
- Significant progress in Dynamic Terrain (weather, weapons effects, etc)